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CARL S. N. HALLBERG.*

Carl Svanté Nicanor Hallberg was born in Sweden, October 13, 1856, in the city of Helsingborg, on the Sound, directly opposite the Danish city of Elsinore, with its ancient fort, in which was laid the scene of the story of Hamlet. His parents were Carl and Anna (Kohrtz). An extended sketch of his early life will be found in the November *Bulletin* of the American Pharmaceutical Association. He served as an apprentice with the wholesale drug house of M. K. Smith & Co. which had just succeeded Smith & Shoemaker at 243 North Third Street, Mahlon N. Kline and Washington J. Sellers, an uncle of Mr. Sellers, of Altoona, having become partners in the firm. A position was then, fortunately, secured with E. B. Garrigues & Co., Tenth Street and Fairmount Avenue, where, under the direction of Edwin M. Boring, a most thorough training and valuable experience was afforded. This pharmacy was a revelation; no patent medicines in the store proper, no soda-water, nor cigars, everything in the most perfect order. Rows of stock-bottles in the cellar labelled in a bold hand—a master hand, which he then recognized but failed to fully appreciate until years subsequently—that of Professor Maisch, who had been employed in the pharmacy in earlier years.

The summer necessitated a change in situation, with J. O. Eberhard, and again at the opening of the College with A. Nebeker, where he remained until leaving Philadelphia for Chicago in the spring of 1877, having remained in the city after graduating in

* We acknowledge the courtesy of Prof. W. B. Day, of the University of Illinois School of Pharmacy, in furnishing the data contained in this sketch, as also for the halftone used in the reproduction of the photograph of Professor Hallberg.—EDITOR.

March, 1876, during the great Centennial Exposition. The next great event, the World's Columbian Exposition (1893), was celebrated by his marriage to Therese Bergstrom, formerly a resident of Stockholm, a son being born in 1897.

After two years of practice as clerk with C. F. Hartwig, of Chicago, he engaged in manufacturing pharmacy, associated with C. G. Wheeler originating the saccharated extracts, of which the "abstracts" of the U. S. P., 1880, were the outgrowth.

During 1888 and 1889 he was associated with C. L. Feldkamp, in the practice of pharmacy in Chicago, the firm engaging in manufacturing preparations of the National Formulary and other pharmaceuticals for which it was awarded the gold medal by the American Pharmaceutical Association, at the exposition held in conjunction with the meeting in Detroit, Mich., in 1888.

First contributing to pharmaceutical journals in 1878, he became the editor of the *Druggist*, afterward the *Western Druggist*, in 1882, relinquishing editorial duties in 1890 to accept the position of professor of pharmacy in the Chicago College of Pharmacy, and in 1896 when this college was united with the University of Illinois his appointment was confirmed by the Trustees of the University. This position he retained up to the time of his death. He joined the American Pharmaceutical Association in 1879, the Illinois Pharmaceutical Association in 1881, serving as secretary in 1890-91, and he has been elected honorary member of a number of western State pharmaceutical associations.

A member of the Committee on the National Formulary since its formation in 1886, he has contributed to its three editions. A delegate to the meetings of the Pharmacopœial Conventions held in 1890, 1900 and 1910, he was elected a member of the Committee of Revision by each Convention.

He has contributed a large number of papers to the American Pharmaceutical Association, embracing a great variety of subjects. He was secretary and chairman in 1892 of the Section of Scientific Papers. He was most active on all questions affecting pharmaceutical education and legislation, having instituted the statistical reports to serve as the basis for more thorough and scientific pharmacy laws.

He had been editor of the *Bulletin* of the Association since its first issuance in 1906, and in almost every phase of Association work he has been an active and tireless worker.

Recently he was elected Chairman of the Sub-Committee on Miscellaneous Galenicals of the Revision Committee.

Since 1901 he has been a member of the Council on Pharmacy and Chemistry of the American Medical Association; in fact, we understand that the credit for the origin of the Council was his; and his pharmaceutical knowledge has been of much service to that organization.

He passed away on October 22, 1910. The funeral services were held at his late residence, 4069 Kenmore Avenue, Chicago. Representatives from all the interests with which he was connected were present.

The honorary pallbearers were members of the Chicago Veteran Druggists Association and the A. Ph. A.; the active pallbearers were Professor Hallberg's colleagues of the Faculty of the School of Pharmacy of the University of Illinois.

The funeral services were impressive. President Eberle made a touching and eloquent address. The funeral pieces were beautiful and numerous. Interment was made in Graceland Cemetery in the lot where the remains of the late Albert E. Ebert rest (the lot being a part of the Ebert Legacy to the American Pharmaceutical Association), in recognition of the services of C. S. N. Hallberg to the American Pharmaceutical Association.

In a letter to the editor of this JOURNAL, Prof. W. B. Day, one of his colleagues, says:

"Professor Hallberg was a man of marked personality and unusual ability. He was thoroughly courageous and at all times ready to give battle for his convictions. His honesty was never questioned, and although his friends were sometimes hurt by his intense aggressiveness which occasionally bordered on harshness, yet almost invariably those who had become estranged from him were won back by the frankness, ability, and evident honesty of the man.

"He possessed a wonderful memory, and kept well informed upon all subjects relating to pharmacy. In fact, he was a veritable mine of information on pharmaceutical topics, and was constantly drawn upon by his friends for help in this respect.

"Friends and former students of his frequently sent him difficult prescriptions from all parts of the United States, and often these were written in some foreign language. Only recently a Nebraska pharmacist sent him a prescription which had been filled originally

in Argentina. It was seldom indeed that he failed to decipher these prescriptions and to give the information requested.

"Professor Hallberg exerted a powerful influence over his students, and this influence was entirely for good; especially would he urge these young men to strive for the attainment of pharmaceutical ideals. He was urgent in his advice that they join the leading pharmaceutical organizations, both state and national, and especially would he use every argument to convince them of the need for their joining the American Pharmaceutical Association. He secured more new members for the Chicago Branch than any other officer, although his time was so occupied that he was able to give but very little of it to this cause.

"His labors were most unselfish, and it is not surprising that he left little property. His interment in the Ebert lot was a fitting recognition of the close personal friendship which existed between these two great pharmaceutical leaders and the many attributes which they possessed in common.

"Professor Hallberg's place in the pharmaceutical world will be exceedingly difficult to fill. Few men possess the energy, mental power, and the physical endurance necessary to carry the amount of work that he carried so successfully for many years."

INSECTS DESTRUCTIVE TO BOOKS.*

BY WILLIAM R. REINICK.

Chief of the Department of Public Documents, The Free Library of Philadelphia.

Through and through the inspired leaves,
Ye maggots, make your windings;
But oh! respect his lordship's taste,
And spare his golden bindings.

ROBERT BURNS.

I have been investigating the subject, "insects that destroy books," for a number of years; and this paper is simply a summary of a few of the facts that I have discovered and collected. No attempt has been made to make it complete, either as to species of insects, or subject matter under any particular group. These, in a

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complete form, with the results of the further experiments now being made to prove the theory advanced, will be published later.

Various insects have been named as the true bookworm. The insect known as the cigarette beetle, *Sitodrepa panicea*, is given as the true bookworm by Prof. L. O. Howard, United States Entomologist; but if the name of "bookworm" is given to the insect which causes the greatest destruction, then this species will have to be placed quite a distance down in the list. Personally, I will not try at the present time to settle the question as to the species which is to be given this doubtful honor.

That a knowledge of the fact that books are destroyed by insects is not of recent acquisition may be gathered from the writings of the ancients.

The earliest reference, according to Austen,¹ was rescued from oblivion by the lad Salmasius, in 1606, when he discovered the manuscripts of the anthology of Cephalus, in the libraries of the Counts Palatine, at Heidelberg. Among the fragments in this collection is one attributed to Evenus, the sophist-poet of Paros, who wrote about 450 B.C.

Aristotle speaks of a "little scorpion-like creature found in books," which was evidently a species of *Acarina* or pseudoscorpions. Horace and Ovid also speak of the bookworm. Pliny, in his "Natural History," has very little to say upon the subject. Martial, who lived in the first, and Lucian, in the second century, A.D., speak of the bookworm, and many other writers mention them; but it was not until 1665, when Hook in his "Micographia," published an account and gave an illustration of the insect, that entomologists were enabled to determine with any accuracy the insect that was named as the cause of the destruction of books. It is impossible from Hook's description to tell what species was meant; but the illustration accompanying the description shows that it must have been a species of *Thysanura* or *Collembola*, commonly known as the silver-fish and spring-tails.

It has been stated that more books and papers are destroyed by small forms of life in one year than by fire and water combined; and, from the facts given by various writers, and the statements made to me in letters by many librarians and others, especially where the libraries are located in the warmer regions, I am positive that

¹ Bookworms in fact and fancy, *Popular Science Monthly*, 1899, vol. 55.

this statement is true. Those in charge of collections in the temperate regions, whose volumes are not as rapidly destroyed, are apt to doubt the enormous destruction of books each year by practically unseen life.

Again, that this destruction is great enough to cause alarm, is indicated by the number of prizes offered by various bodies for means to prevent this never-ceasing destruction. Prizes were offered by the "Royal Society at Göttingen" in 1774, the "International Library Congress" in 1903, etc., but as yet no satisfactory results have been obtained. I hope before long to be able to present to the world the cause of these ravages and a means of preventing them.

Those who have read articles upon the destruction of books and papers by insects must have noticed that in almost all the papers the author has simply stated that the insects were after the paste used in the binding; and most of the prizes that have been offered from time to time have the same object in view. If the paste is the object of attack, why is it that photographs, which are fastened to the cardboard by means of paste, are not eaten?

Although some of these writers have stated that the bindings were bored or gnawed, a gallery leading from an opening made on the outside towards the interior of the book; that the glazed surface of the paper was eaten off; that in a few cases that portion of the page which had received the impress of the printer's ink only had been eaten, making the page look as though the letters had been cut out with a punch; and again, that a cavity had been found in the interior of the book, without showing by what means the insect was able to obtain access: not one of them, as far as I have been able to find, has reasoned upon the question that there might be other causes for these ravages of the insects upon books besides the hackneyed phrase, "that they are after the paste used in the binding, in order to obtain the starch contained in it."

Having read hundreds of articles and notes upon this subject, and having had the pleasure, from my standpoint—but not that of the librarian, of examining many hundreds of volumes of ancient and recent date of publication, with bindings made of different leathers, paper made of rag, wood, and other materials, my attention was before long attracted by the fact, that in the great majority of books examined no attempt was made by the insects to eat the paste used in the binding, and also by the many cases in which a

cavity or cavities were found in the interior of the volume without showing the means by which the insects obtained access thereto.

Looking at the various ways in which books were ravaged, and knowing from my own studies and observations in entomology that the insects have wonderful instinctive powers, which in a number of cases could very easily be classed as intelligence, I have come to the conclusion that there must be other reasons besides the desire for paste, to cause these various depredations, and I have asked myself this question: "As we know that the dog and cat, when sick, look for certain herbs, grasses, and putrid animal matter, being directed by their instinct to that substance which contains the vegetable and mineral matter which is best suited for the particular ailment from which they are suffering at that particular time, may not the insect, with an instinct as great if not greater, have use for them for the same purpose?" It seems to me, that the lower we go in the scale of life, according to the classification of the systematists, the more wonderful are the instinctive faculties of the small forms of life, and that if a classification was made according to instinctive faculties, it is a question whether the ants would not outrank the animals by many degrees.

The new school of medicine, in departing from the system of the old, that is, that in which Hahnemann in following Paracelsus claimed that certain symptoms in human beings required mineral agencies and vegetable compounds in potencies equivalent to the complaint, neglected to study the power of drugs, and results not anticipated frequently occur, caused by not using judgment in the quantity of the dose given. Those interested in finding means for destroying life that is destructive, should use the means as those advocated by Hahnemann in their researches.

Starting upon this theory which I contend will be found to be true, when biologists, physicists and entomologists have searched more deeply into the evolution of the lower forms of life, I divided the books into classes according to that portion which was damaged, and will describe some of the most important and name a few of the insects which attack that particular group.

PASTE EATERS.—Science has proved beyond doubt or question that there can be no destruction of matter, only a change of form. If there is no destruction of matter, then we have a demonstration of the theory of the worm or larva having been attracted to the paste used in the binding of the books. In the agricultural kingdom we

find that rye, wheat, and the various other varieties of grain are constantly being damaged by the work of different species of insects. These insects and other small life live upon the exudations of plant life, and the human body is also giving off exudations in the form of perspiration which is also a source of nourishment to many forms of life.

We will take rye and wheat, which are principally used in paste making, as an example. The whole grain is taken to the mill, husked and ground, and prepared by various processes for the sustenance of the human family. After all the processes of the miller have been completed, it is barrelled or bagged and is ready for distribution. In the processes we find that alum has been and is still being used as a whitening agency for the different grains. The flour is taken into the factory apparently pure, clean, and free from all forms of animated life; but in a very short time, especially if it is kept in a compartment that is heated, or in a moist atmosphere, and is left standing some time before being used, life is apparently created in it, a puzzle to all, as to its origin and nature, and stranger still, the first life noticed is always worm life. In this case it is known as the "flour-worm." Mr. James Stone, a flour merchant of Philadelphia, in reply to my questions, stated that they always discovered the worms first, that they were only found in the centre of the barrel, never near the sides, and that the loose flour laying around the floors, of which there always was a quantity, was never found to have worms in it. The lower or coarser grades which are used exclusively for paste were first damaged. The finer grades were more seldom found to be affected. This goes to prove my theory that the life was in the flour before grinding, and that it lay dormant until the proper conditions were produced, such as heat and dampness. The grinding of these grains allows the gases in the air to reach the particles which, to a large extent, were before protected by skin or husk. These gases cause a chemical change to take place, which has been little studied, and this will be found to give food for forms which were heretofore in a dormant condition. Many eggs of the smaller forms of life can hardly be seen, even with a compound microscope. The following are some of the species that may be classed as paste eaters: *Pyrallis farinalis*, a moth, and *Tenebroides mauritanicus*, *Silvanus surinamensis*, *Calandra granaria*, and *Tenebrio molitor*, all beetles.

PAPER.—Paper is made from cotton, linen, hemp, rags, and

waste, from chemically prepared woods, from straws, from bark without the wood, from wood not chemically prepared, and many other substances. In a great many papers, clay and other minerals are added as fillers. While we are conversant with the various processes used by paper manufacturers, yet very little attention has been given to the real character of life that dwells within the manufactured product in its primoid state. Cotton fly is used for low paper stock, and the little insect that infests the cotton boll, known as the cotton weevil, sends forth its offspring under a different form, yet with all the instincts of itself.

After the paper has passed through certain stages, but not with sufficient intensified heat to destroy the principle of existence, the species evolutionizes into another state or mode of living. In the broader conception of biological truths, ready answers are given to this profound question, *i.e.*, the origin of various forms of life, and the researcher has ready for the querist the proper foundation whereon to build the superstructure of that truth which the arcanum of nature reveals to the desires of the mind of the scientist and physicist. Too little attention has been given to the manuscript notes of scientific workers, often only a line or two of their observations upon the small forms of life. The average scientist thinking it too trivial to notice, often passes over the very observation, which is the key to the puzzle that he has been spending years in trying to solve.

PAPER EATERS; WOOD PULP.—A species of insect, frequently found in libraries, is the *Cimex lectularius*, vulgarly known as the "chinch" or "bed-bug." Its natural instinct leads it to wood on account of certain poisons in the form of acids contained therein, and certain nourishments which are of a poisonous character to the human being, but beneficial and necessary to insects and worm life. Where paper has been manufactured from wood pulp, containing the particular acids or poisons which the "bed-bug" requires, there you will find the insect with all its instinctive faculties. Why do they live and thrive under wall paper? Many wall papers, some of which are known to be a cause of illness to mankind, have large quantities of arsenic, cochineal, and paris green in them. This mineral compound, being changed by the continual variation of temperature going on in the room, is sufficient to change the natural character of the paper, and also the habits of the bugs, who are thus able to obtain nourishment from the back of the paper.

Among this group may be found the following beetles: *Apate capucina*, *Xestobium tessellatum*, and *Lyctus unipunctatus*.

PAPER EATERS; VEGETABLE FIBRES.—In the Aztecan history many of the primitive documents were made from banana skin. These were made to receive the imprint, just the same as paper is manufactured for printing to-day. A sample of this paper was placed in a perfectly sealed case, and a scholar wishing to refer to it one day, upon going to the case containing the writing, was astonished to find that all the paper had been entirely destroyed, although the case was still impervious to any attack made from the outside. This demonstrates how long life may be prolonged, in the sense of the insects being placed away from their natural surroundings, continuing the life cycle whenever the proper conditions are given.

Trichophaga tapetzella, *Tinea pellionella*, *Tineola biselliella*, and *Plodia interpunctella* are a few of the moths that bore into paper in order to obtain access to the fibres.

PAPER EATERS; MINERAL FILLERS.—This group includes papers where quantities of clay and other mineral substances have been used as fillers. For an illustration we will take the character and life habits of the *Termites*, or white ants, which are in a measure destructful to material utilized in the manufacture of paper. The alluvial deposits are natural to the white ant, consequently, when clay is used in the manufacture of paper, the instinct in the ant leads it to feed upon that which is natural to it, especially if the books have been kept in a place where it is damp. The lower organic life is, but in a measure, an evolution that is manifested in the higher and more complex forms of life. In the mountainous region of North Carolina is found a collection of people who eat large quantities of clay which is found there in abundance. These creatures, the whites being designated as "poor white trash," and the negroes as the "blue-gummed negroes," are addicted to the habit of clay eating, and nearly all are veritable living skeletons. The eyes and gums of the whites have a reddish hue, and their skins become a dirty yellow; and the gums and skins of the negroes take on a bluish hue. This clay contains arsenic, and, instead of clay eaters, they might more properly be called arsenic eaters. The supply of clay for daily use is provided with more energy and precision than food. This clay poisons the saliva exuding from the glands of the mouth, and also from the base of the teeth, and makes their bite probably poisonous.

And so we see the special laws of nature by which forms of low life live, actuated by the first principles of their instinct to return to their primitive mode of feeding; that is, the life that is generated from the botanical kingdom, much in sympathy with the facts established by Dr. Hahnemann, which verifies the principle that like attracts like.

Monorium pharonis, or red ants, *Termites*, or white ants, are found destroying paper that has clay in its composition. The first named is also fond of saccharine that is found in wood fibre.

PAPER EATERS; ANIMAL FIBRE, PARCHMENT.—Insects, such as roaches, which destroy parchment, are after the oils and fats which are used in their preparation; for however carefully the parchment may be prepared, there is always a certain amount of oil and grease left in it. These oils are obtained from the plants, minerals, and animals of the earth, which the roaches have always been used to; therefore, when placed in a location away from their natural food supply, their instinct compels them to seek those books which have the foods, etc., in their composition to which the roaches formerly had access. After the processes of the manufacture of the paper have been completed and it is ready for the printer, another transitional change is nigh, due to the chemicalization of the inks that are used.

Parchment is especially eaten by the roaches, *Periplaneta americana*, and *Ectobia germanica*, the crickets, *Gryllus assimilis*, and some species of *Coleoptera*, or beetles.

SKIN BINDINGS.—Bindings made of skin always have a certain amount of oily or gelatinous substances in them, even though they may seem perfectly dry to the observer, and these bindings are subject to the ravages of the insects that in their natural state go after substances containing oils and greases. Leather that is perfect in its external appearance, under degrees of dampness will expand, and under degrees of heat will contract. The oil is hidden at the bottom, and does not come to the surface until pressed out by expansion caused by dampness. The skins contain the same elements in the dead state as in the living, and the bindings will be attacked by the same forms of life that lived upon the live animals, because they can still find the mineral poisons and the alluvial substances that were part of their natural food supply. Leather bindings are also subject to the depredations of insects and worms which are partly after the oils, acids, and fats which are in the skin, as well as from the new

life that has been conveyed to it by the uncleanness in preparing the leather, not including the hundreds of substances, many of them poisons, especially tannic acid, used by the tanners for tanning purposes, which are also attractive to other species of insects. And just as the animals which eat the plants containing various chemical elements thus become impregnated with acids, so will the insects living upon animals and plants be found to have acids in their compositions.

The leather is destroyed by a number of species of beetles, such as *Lasioderma serricorne*, *Attagenus piceus*, *Dermestes lardarius*, and *Anthrenus scrophulariæ*.

WOOD BINDINGS.—The beetles, *Anobium hirtum* and *Ptilinus serricornis*, are found making galleries in the wooden covers of books.

POISONS USED, MINERAL.—We have in the minerals of the earth many poisons, one of which, arsenic, is of especial interest, as it has been the established rule of the wall paper manufacturers to use it in large quantities; and this poison is one that attracts various species of insects on account of its medicinal value. Just as human beings take poisons in proportionate ratio to the needs of their systems, and especially arsenic, for their health, so do the insects and lower forms of life, which have an instinct beyond the ordinary comprehension, need it; and they find it in the wall papers and colored illustrations printed on the bindings and in books. Where sulphur is used, other species will be attracted, and so on with the various poisons which are used in the arts. The "bed-bug" also finds food in the poisons used, such as arsenic, Paris green, etc. The idea that this insect is found only where uncleanness prevails has long since been rejected, as it is constantly found where absolute cleanliness prevails.

Flies will cling to wall paper, especially in damp weather. This is due to the moisture in the atmosphere causing the poisons in the paper, which flies are primarily after, to become soft enough for them to eat.

GASES; FROM HEAT.—It is accepted as a fact by scientists to-day that the nature and character of life, in the material sense of evolution, has for its base the heat generated by the physical sun, assisted by the moisture of the atmosphere, and the darkened chambers of the earth, which are necessary in the first stages of all life production. Books in a very dry and warm location will be found to be

subject to attacks of species of *Thysanura* and *Collembola*, which are naturally attracted by heat; and, as heat rises, the books on the top shelves will be found to be the ones damaged by these insects. They are seldom found where it is damp.

The spring-tails, *Lepidocyrtus americanus*, and the silver-fish, *Lepisma-saccharina*, come under this group.

GASES; POISONOUS, ETC., COMBINED.—The tree, from which is made the wood pulp used in the manufacture of paper, has its roots shooting down into the bowels of the earth, and its branches and leaves reaching up into the heavens. The roots are fed by a varied combination of elements, mineral, gaseous, and vegetable, and these elements, taken in by the roots, are by a wonderful system of arteries carried into every portion of the tree, and insects are thus able to get all elements that are necessary for them to sustain life. The pores of the skin are the health holes of the body, and in a sore, unless it is sterilized, life is bound to start, and that first life again is worm life, no matter how carefully the wound is protected on the outside. If a microscope was used, the body would be found to be covered with animated matter. The insects, preying upon animal life, are after the poisons exuded by the blood and skin.

OMNIVOROUS.—Among the insects which can find food in all portions of the books may be mentioned the beetles, *Sitodrepa panicea* and *Tribolium confusum*.

CARNIVOROUS.—The following are some of the forms of life found preying upon insects found in libraries, the centipede, *Scutigera forceps*, pseudoscorpions, *Bryobia pratensis* and *Tryoglyphus longior*. I believe that investigation will show that the two last species are injurious to books.

RESEARCHES.—Some of the statements here made seem radical, but when it is considered how little is known of the life habits of the lower forms of life, on the one hand, and the facts given by the few life histories that are known, on the other, it does not appear to me unreasonable to place this theory before the public. Especially so, as my own experiments are showing results entirely different from anything hitherto published.

It is known that the eggs of the insects under adverse conditions will stay fertile for long periods of time; that the eggs will also stand a very high or low temperature; and, on account of the toughness of their skin or shell, are also able to stand a great deal of handling and pressure without being crushed or broken. At an

institution with which I was officially connected for a number of years, a lot of mosquito eggs were received from Cuba. These eggs had been attached to a piece of rough blotting paper, and sent to us through the mails. Upon receiving them, thinking that they had been ruined by the rough handling and pressure that they must have received in transit, the blotting paper was thrown aside and allowed to lay exposed to the dust of the atmosphere and the rays of the sun for many months. One day, in a spirit of fun, some one threw the blotting paper into some water, and, to the surprise of all, in a very short time, the larvæ were swimming around as though nothing had ever happened to them.

All plants, vegetables, trees, etc., have certain combinations of chemical elements which are only found in them, as is known from chemical analyses which have been made of material from them, and each of these have certain forms of life which live upon them, and whenever any of these trees, etc., are used in the manufacture of paper and preparation of leathers, eggs of the different species are most likely to be found incorporated in the material; hibernating, as it were, until the proper conditions through heat or dampness come about, giving life to the germ within, and in a very short time the little worm is enjoying life, although being evolved perhaps, later than nature intended it to be.

Again, wandering insects come into the library, and their instinct tells them what books contain the particular food or medicine for which they are seeking. These little insects pass through their various states of evolution, with long periods of life, which are unknown to the finite mind of man as to the exactness of the length of their lives, and are always evolving up to a point of superior consciousness. We must give credit to the entomologists for their researches as to the laying of the eggs of the winged insects, that in time, by the active energies of the physical universe, produce life which becomes expressive, by a process of incubation which has been very little considered. These various illustrations are exhibited to express the nature and character of that which has been infectious to the libraries of the world. While many of them will seek for the paste, it is not always that which attracts them. They are also attracted by the mineral and vegetable substances found in books.

DISEASE CARRIERS.—Just as diseases are carried by flies, the seeds of plants by birds and the winds, so are contagious diseases carried to new locations by books and papers. Flies coming from

putrid matter, or from a person suffering from a contagious disease, by depositing disease germs on books provide the means, if given the proper conditions, of spreading these diseases to a locality where they were unknown before, not to mention the possibilities of fleas, germs, and bacteria. From my knowledge of the ability of bacteria to attach themselves to paper, I am positive that future research will show that books and papers have been the means of spreading many cases of disease. The question of doing away with bank notes has been agitated for years, on account of the disease germs and bacteria carried on them, absorbed from the unclean hands which handle them. A letter received by me from the United States Bureau of Animal Industry states that, "Several years ago, however, at the request of a Representative in Congress, an examination was made by this bureau of a one-dollar Treasury note with the view of determining the number of organisms thereon. The note used for the investigation was obtained on February 3, 1904, from the U. S. Treasury, having been withdrawn on that date from circulation. It belonged to Series 1890, and hence had been in circulation thirteen years. While the note looked very old and quite soiled, one often receives notes of even worse appearance in ordinary business transactions.

"The note in question was subjected to the ordinary laboratory manipulations for determining the number of micro-organisms upon it which were capable of vegetation and development, and as a result of this examination it was found that there were 13,518,000 living micro-organisms present on this note. These consisted principally of the organisms popularly known as bacteria and fungi." Uncleanliness is more to blame than the paste in the books for insects found destroying them.

The fleas, *Pulex serraticeps*, and other species, and the *Acarina*, or pseudoscorpions, are also capable of carrying disease germs.

REMEDIES.—As far as the destruction of these insects by poison is concerned, they are practically worthless, because, whenever the poison is used to destroy one insect it will attract other insects that have need for that poison. Uncleanliness of the human family also helps to supply the needs of the bookworm. Men and women do not give the proper consideration to their hands, going from the dining-room into the library, either public or private. Nature, by its process under the great infinite power, has supplied the skin of the human body with scales and pores, and these, acting upon

their functional duties, are constantly discarding that which the body in a healthful state does not want. In perspiration, which is moisture, there is thrown from the pores of the skin a combination of mineral and vegetable acids, and this may all be summed up in the word "dirt." This combination, or dirt, contains food for a number of species of insects. When the hands which are soiled are laid on clean paper, some of the matter attached to the hands will be left upon the paper, in this way producing food for insects. We say this, because man from a material stand-point has his grosser body made of matter, and matter in a concrete form is made of the dust of the earth. Cleanliness in the handling of papers, books, and documents will be of more value than all the poisons combined. Let common-sense prevail, make sanitary rules in the home and in the public library an enforced rule, and it will lessen and arrest the rapid growth of the little insects which feed upon our silent friends of so much value to us, besides eliminating the possibilities of contagious diseases. The library of the future will be found to contain laboratories where every one wishing to make use of the books in the collection will first have to thoroughly cleanse his or her hands. This is a subject which should be considered in the near future by the bacteriologist, as well as the entomologist, biologist, and general visitors to the halls of learning.

SHALL WE HAVE A PROFESSION OF PHARMACY?

BY F. E. STEWART, PH.G., M.D.

(Concluded from p. 534.)

There is some truth in this claim, but if the physicians and pharmacists of this country had given the public a square deal regarding materia medica products, the present conditions need never have arisen. Unfortunately, the medical schools have neglected to properly teach materia medica, while the retail druggists have carried on a proprietary medicine business of their own on a smaller scale, to which are equally applicable the very objections they now urge against the manufacturing houses. But a reaction has occurred. The worm has turned. And the pure food and drug laws, instead of resulting from co-operative effort on the part of the medical profession and the retail druggists to reform conditions, are largely due to public resentment of the deplorable conditions mentioned. This reform should have come from the medical and pharmaca-

press, not from *Collier's Weekly*, the *Ladies' Home Journal*, and other non-professional publications.

On the other hand, all must concede that centralization is the tendency of the day in all lines, and the great manufacturing houses have come to stay. Nearly every manufactured article is now produced on a large scale by great plants, with which individual houses working on a small scale cannot hope to compete, and as standardization of all products becomes more prevalent the small manufacturer will have still less chance of success. The cost of standardizing one pound of steel as to carbon content is as great as the cost of standardizing a ton, therefore standardization work cannot be economically conducted except in relation to large outputs, and the same principle applies to materia medica products.

This evolutionary process, due to economic conditions and representing advance in civilization, is by no means completed. Whether or not it will end in socialism remains to be seen. The socialization of medical and pharmacal practice has its advocates, but this phase of the subject is outside the limits of my lecture.

THE RETAIL DRUGGIST AS A MANUFACTURER.

Under a professional system, with its common standards and freedom from monopoly, all retail druggists have equal chances as manufacturers, while under the proprietary system, with its monopoly and misleading advertisements, the advantage is on the side of the manufacturers of nostrums, therefore, as a matter of self-interest, the retail druggists should favor the ideal of professional pharmacology. As a class, however, they oppose legislation tending to limit the nostrum business, possibly because each druggist dreams of himself becoming a nostrum king.

Many prescriptions call for ready-made preparations of various kinds, which are now supplied by the manufacturing houses in the form of sugar-coated and gelatine-coated pills, tablets, filled capsules, etc. Druggists engaged in the U.S.P. and N.F. propaganda hope that doctors will discontinue the use of such ready-made products and return to prescription writing, but the tendency away from polypharmacy toward the more scientific use of drugs is as unfavorable to the polypharmacy extemporaneous prescription as to the ready-made polypharmacy prescription.

Progress in pharmacotherapy is along the lines of standardized

materia medica products, and future standardization will include pharmacognosy, pharmaceutical assaying, and pharmacodynamic tests on animals. This is expensive, and must be done on a large scale.

WHAT IS THE USE OF PHARMACOLOGIC EDUCATION?

The answer to this question is frequently pessimistic, but my personal answer is optimistic. I believe the future outlook for drug therapeutics is better. Never before has there been greater need for a profession of pharmacology. The members of the profession will naturally specialize. Most of the research work will be done by those engaged in government laboratories and in teaching, although those employed by the large manufacturing houses will conduct original investigations on a smaller scale. Those engaged in the retail drug business will be learned in pharmacologic science, and will occupy the positions of experts regarding the preparation of drugs and their application as remedial agents. They will be manufacturers as far as their facilities permit, or else hold stock in some large manufacturing house, doing all in their power to promote its advancement.

This, at least, seems to be the tendency of things. And this is for the best interests of the public, as it will place the practice of the pharmacologic arts under the control of the pharmacologic profession, where it properly belongs.

PHARMACY LAWS.

It is evident that enforcement of the professional ideal of pharmacologic practice under present conditions will place professional pharmacists and manufacturers at a disadvantage in competition with commercial druggists and manufacturers of the so-called "proprietary" medicines. "Professionalism" requires that new products be surrendered for the general good and that all members of the profession be taught how to make and use them. "Commercialism" means the monopoly of new products by individual manufacturers, firms, or corporations, and their introduction to commerce by advertising.

The anomalous conditions of law in this country, by which manufacturing houses are exempted from the operation of both medical and pharmacal laws, permit any person, however ignorant, to set up as a manufacturer and thereby practise pharmacy and therapy

at wholesale without license, to the detriment of the public health. This is one of the abuses for the pharmacologic profession to remedy, and the way has been pointed out by the U. S. Supreme Court in the previously mentioned decision in the Syrup of Figs case. Manufacturing houses should be licensed as are individual pharmacists and physicians.

COPYRIGHT, PATENTS, AND TRADEMARKS.

Contrary to common opinion, names of medicines cannot be copyrighted, as they cannot be privately owned by any one. This statement can be verified by addressing the Librarian of Congress. It is an axiom of law that the name of an article of commerce cannot be a trademark, for it cannot at the same time perform the functions of an appellative to distinguish an article from other articles of commerce and a trademark to distinguish a brand from other brands of the same article.

I cannot here repeat all that I said on this subject in my lecture, but I would refer you to the following authorities: the chapter on "Copyright" in the Encyclopædia Britannica; Browne on "Trademarks"; Kerley's "The Law of Trademarks"; "Report of the Commissioners Appointed to Revise the Patent and Trademark Laws under Act of Congress Approved June 4, 1888," known as "Senate Document No. 20."

The medical profession is standing between two opinions regarding patents on materia medica. One side takes the position assumed by Lord Camden in his celebrated speech on the subject of copyright, when he said: "Glory is the reward of science, and those who deserve it scorn all meaner views."

Those who believe in the patenting of materia medica products agree with the statement of Terrill in his "Treatise on Patent Laws." According to this authority, "The theory upon which the laws rest is that it is to the interest of the community that persons should be induced to devote their time, energies, and resources to original investigation for the furtherance of science, the arts, and manufactures. This was recognized from the earliest periods which can pretend to be described as civilized. It is to the advantage of the whole community that authors and inventors should be rewarded, and no measure of reward can be conceived more just or equitable, and bearing a closer relation to the benefit conferred by the par-

ticular individual, than to grant him the sole right to his writing or discovery for a limited period of time."

Scientists in every line take the position that "Glory is the reward of science," and refuse to recognize as a scientist any person who attempts to monopolize the results of his observations or discoveries. It is said that the true scientist works for pure science, not for the application of science to practical purposes, and that if the medical profession wishes to be a truly scientific body, physicians must not only refrain from patenting their inventions and discoveries, but refrain from commerce in materia medica inventions and discoveries.

The professional ideal of the vocation is represented by a class of pharmacists who believe, with me, that those engaged in the practice of the pharmacologic arts should be supported by commerce in materia medica products, but that such commerce should be conducted as a professional (not commercial) vocation.

Carried to a logical conclusion, strict enforcement of the scientific ideal would exclude authors of medical books who take advantage of copyright law to secure monopolies of the products of their brains. The copyright law has been found necessary in order to protect capital engaged in the business of publishing medical books; and, without danger to science, the patent law can be applied to the protection of the materia medica supply business. The patenting of processes and apparatus for manufacturing products promotes progress in pharmacologic science and arts so long as the patents do not cover the products made thereby. If the sale of the products themselves is monopolized, then the tendency is to force them on the market by misleading advertisements; and, as the errors of commercial exploitation cannot be corrected by impartial discussion, owing to the influence exerted by the manufacturers of controlled products upon the entire press of the country, medical, secular, and religious, the monopoly is disastrous in its effects upon pharmacologic science and practice.

THE INTRODUCTION OF NEW BRANDS OF MATERIA MEDICA PRODUCTS TO COMMERCE.

Introducing new products to science differs greatly from introducing new brands of manufacture to commerce; the former requires scientific methods, the latter, commercial ones. But it should be remembered that "Commercialism is not a word in good repute in

connection with the practice of medicine." And this includes pharmacy or the manufacturing of medicines for therapeutic use. The making of money is the mainspring of commerce, and while money-making is not wrong, *per se*, medicine (including pharmacy) has a higher and a nobler aim. If it be not so, our widely uttered claims of being a liberal profession are false, and a large proportion of what we may call the non-scientific part of medical literature (including most addresses to graduating classes in medicine and pharmacy and to societies) is the veriest talking for effect.

CONCLUSION.

Shall we have a profession of pharmacology? Yes. But the scope and title of that profession should be enlarged to include the co-operative practice of the pharmacologic arts by physicians, pharmacists, physiologists, botanists, chemists, and all others engaged in investigating and classifying the *materia medica*, and in selecting, preparing, preserving, compounding, and dispensing drugs, and in applying them to the treatment of the sick.

How shall we have a profession of pharmacology? That question cannot be answered in a paragraph or page. Only by complete study of the subject, along the lines I have mapped out, can the answer be ascertained.

PROGRESS IN PHARMACY.

By M. I. WILBERT, Washington, D. C.

A QUARTERLY REVIEW OF SOME OF THE MORE INTERESTING LITERATURE RELATING TO PHARMACY AND MATERIA MEDICA.

The leading topic for discussion, in medical circles at least, is the possible influence of the report of the Carnegie Foundation on the advancement of medical education, and the really serious attempts that are being made by medical schools generally to raise their requirements for admission as well as improve on their facilities for teaching.

Medical Education.—An interesting illustration of the possibilities is evidenced by an article by Henry S. Pritchett, president of the Carnegie Foundation for the Advancement of Teaching, in a recent number of *The Outlook*, on how to study medicine.

He refers more particularly to the fact that the art or science of medicine has been practically revolutionized during the past twenty years and that its practice to-day rests on certain fundamental sciences which were scarcely known thirty years ago, and then points out very clearly that sectarianism no longer has any reasonable cause from existence. The article is commented on editorially in the *Journal of the American Medical Association* (1910, v. 55, p. 1292).

Medical Education in the United States.—The educational number of the *Journal of the American Medical Association* (August 20, 1910) contains brief descriptions of the medical colleges in the United States and Canada that are legally chartered to teach medicine. Also enumerates the foreign medical colleges and discusses educational standards abroad and at home. An editorial in commenting on the report points out that the total number of medical students in the United States for the year ending June 30, 1910, was 21,526, a decrease of 619 from the previous year and a decrease of 1076 from 1908. A rather significant indication is the fact that the total number of graduates from the so-called sectarian schools has decreased annually during the past ten years.

Meeting of the American Medical Association.—The Board of Trustees of the American Medical Association have decided on June 27, 1911, as the date for the opening of the next session of the American Medical Association, in Los Angeles. This date, which is later than usual, was chosen so as not to interfere with the men connected with medical colleges and was also thought to be more generally convenient for those who desire to take advantage of this occasion for a vacation (*J. Am. Med. Ass.*, 1910, v. 55, p. 1558).

Pharmaceutical Education.—Wilhelm Bodemann, in commenting on the Richmond meeting of the American Pharmaceutical Association, expresses the opinion that the one thing that impressed him most has been mentioned least. He refers here to the formal call on the "Carnegie Foundation" to report on the pharmacy schools of the country much in the same way that they had reported on medical schools (*Pacific Pharmacist*, 1910, v. 4, p. 187).

C. S. N. Hallberg.—The death of Prof. Hallberg brings with it a serious setback to pharmaceutical education in these United States. For many years he was one of the foremost champions

for advancement in matters pharmaceutic and, though not always right, he labored and fought according to his light, and this, it must be admitted by all, was kept bright by closely following the medical and pharmaceutical literature of the day. His incentive and co-operation will be missed in many fields, but in none so acutely as in the frequently fallow field of pharmaceutical education.

Berlin Pharmaceutical Institute.—A news note announces the publication of an attractive volume commemorative of the centenary of the University of Berlin. The book is entitled "Das Pharmaceutische Institut der Universität Berlin," and is written by Professor Dr. Hermann Thoms, Director of the Institute. It contains an account of the development of pharmaceutical education at the University of Berlin since its foundation in 1810, and a detailed description of the buildings now in use (*Pharm. J.* (Lond.), 1910, v. 85, p. 487).

International Congress of Pharmacy.—The International Congress of Pharmacy, held in Brussels, September 1 to 6, 1910, promises to have a potential influence on the progress of pharmacy in all of the many countries represented.

The question of the approximation of the several national pharmacopœias is one that is of great importance and received due consideration, and the communication presented by Dr. Schamelhout on the unification of analytical methods promises to be of service in correlating the standards and the tests included in the several pharmacopœias.

Nomenclature.—It is unfortunate indeed that the International Congress of Pharmacy paid little or no attention to the possibility of developing an international nomenclature for widely used medicaments. A recent article in *Science* (October 28, 1910, p. 594) in commenting on the work done in this connection by the Brussels Botanical Congress, and by the International Congress of Zoölogists, which met this year at Gratz, says: "The fact that the problems of nomenclature have assumed sufficient importance to be considered by international congresses should sustain our hope for further progress, especially when we recognize that such matters are subject to the general laws of evolution and education and that perfection cannot be attained at a single bound."

Commercialism in Pharmacy Abroad.—An editorial in the *Pharmaceutical Journal* points out that the proceedings of the International Congress of Pharmacy appear to indicate that the com-

mercial element has evidently invaded the pharmacies of our Continental *confrères* to a most unfortunate extent in recent years, and, like English pharmacists, they are desirous of having as interest on their capital, as pay for their labor, as indemnity against bad stock, and as an honorarium for the use of their diploma, some profit on the articles which they sell (*Pharm. J.* (Lond.), 1910, v. 85, p. 361).

International Pharmaceutical Federation.—One of the more important actions of the International Pharmaceutical Congress, held at Brussels, was the adoption of a resolution, proposed by the delegates of the Dutch Association for the Promotion of Pharmacy, which provides for the foundation of an International Pharmaceutical Federation, with headquarters at The Hague. The object of this federation will be the promotion of pharmacy as a science and as a trade, and it is to consist of delegates representing the various affiliated societies.

As pointed out in a recent editorial in the *Pharmaceutical Journal*, London (1910, v. 85, p. 435), the laws and customs governing the practice of pharmacy on the Continent differ fundamentally from those in force in English speaking countries and the deliberations on the business side of the occupation while interesting are of but indirect value to pharmacists either in Great Britain or the United States, so that the benefit to be derived from international co-operation is limited indeed.

National Department of Public Health.—The need for developing a more efficient organization for the protection of the health of our people is still uppermost in the minds of thoughtful citizens and has been given considerable space in the pages of medical and pharmaceutical journals.

Among others, Geo. B. Young discusses the nature of the problems involved in the proposed enlarged national public health organization and outlines a plan with reasons for adopting the divisions as proposed. An editorial in commenting on this paper points out that it offers a tangible basis for discussion and can be taken as a starting point for actual constructive efforts; also that the problem of unifying all of the present health work under one general head is one whose solution should not be attempted without careful study of existing conditions (*J. Am. M. Ass.*, 1910, v. 55, pp. 979-989, 1029).

Public Health Agitation.—E. J. Townsend, in discussing

"Science and the Public Service," expresses the belief that as a nation we should do as much to promote the conditions for healthful living among our people as to stimulate the development of our national resources. He points out that every citizen, irrespective of vocation, is vitally concerned with those scientific facts that mean better sanitation, better facilities for overcoming and preventing the spread of infectious diseases, in short, with all that knowledge which will enable us to live better, longer, and happier (*Science*, 1910, v. 32, pp. 609-621).

National Association of Retail Druggists.—The Pittsburg Convention of the National Association of Retail Druggists, held September 12-16, 1910, has been characterized as being the most harmonious ever held.

The proceedings throughout evidenced conservatism and the convention will no doubt go far to strengthen the association with the retail druggists of this country.

The opposition of the N. A. R. D. to public health legislation was considerably modified, and, on the recommendation of the Committee on National Legislation, it was resolved that this committee carefully consider proposed legislation and, if necessary, prepare and submit amendments thereto, to the end that in the organization of such department or government division, pharmacy be properly recognized and represented.

Materia Medica in Medical Colleges and in State Board Examinations.—The Committee on Materia Medica of the National Confederation of State Medical Examining and Licensing Boards and a similar Committee of the Council on Medical Education of the American Medical Association present a report that is designed to foster a more thorough knowledge of the really important drugs, such as are commonly conceded to be practically indispensable in the general practice of medicine at the present time.

The list contains less than 150 drugs, but includes practically all of the really important substances, and a medical practitioner who is thoroughly familiar with the uses and the limitations of the several substances that are enumerated would be thoroughly well equipped to meet any possible indication or need.

An editorial in commenting on this list points out that the medical student, or even the physician, who tries to gain a thorough knowledge of the ridiculously large and bewildering number of drugs on the market is attempting the impossible. He acquires

real practical knowledge of none. In consequence his knowledge of the action and uses of even the most important drugs is often vague and imperfect (*J. Am. M. Ass.*, 1910, v. 55, pp. 1292, 1302-1303).

List of Drugs for State Board Examinations.—Haines and Fantus call attention to a list of drugs devised by the Committee on Pharmacology of the Chicago Medical Society, during the winter of 1908, and adopted by the Illinois State Board of Health as a guide in the elaboration of its examination questions. This list contains approximately 120 drugs and preparations and is practically identical with the list mentioned above (*J. Am. M. Ass.*, 1910, v. 55, p. 1573).

A Restricted Materia Medica.—William J. Robinson, in commenting on the proposition advanced by the State Medical Examining and Licensing Boards, advising the restriction of materia medica examinations to a comparatively small number of drugs, asserts that it is certainly better to know 100 drugs well than 1000 badly.

Pharmacopœial Revision.—The Pharmacopœial Convention which met in the City of Washington last May is still being actively discussed in local and state organizations and also in current journals. In a recent number of the *Pacific Drug Review* (October, 1910, pp. 16-20) Mr. Peder Jensen presents some thoughts that are well worthy of consideration.

Commenting on the several interests represented at the Convention he says: "Of these the medical interest was perfectly legitimate, commendable, and should receive the recognition and approval of the pharmacists of the United States, for unless the medical men are given an opportunity and right to frame up the contents of the Pharmacopœia to suit every reasonable demand that they might present, we could hardly expect that all the past or coming missionary efforts to induce physicians to use the Pharmacopœia should bear any fruit."

In regard to membership of the General Committee of Revision he says: "I feel personal regret that more medical men were not accepted. I also feel personal regret that the Convention should lower itself to a deliberate piece of trickery in excluding medical representation. The day will come when medical men will have the greater responsibility and a greater claim to the framing of the Pharmacopœia."

Commenting on the nature of the coming Pharmacopœia he says: "The Pharmacopœia that the pharmacists of the United States demand must be one that is so precise in its every direction, so careful in the most minute detail, that any person engaged in the practice of pharmacy will be able to perform each and every operation directed in the work."

Use of the Pharmacopœia.—An abstract from the *Lancet* points out that the recognition of the British Pharmacopœia as containing official standards for medicines has tended more and more to make the chemical portions of the book encroach upon the medical portions. In other words there has been a tendency to consider the Pharmacopœia from the analyst's point of view rather than the physician's. The abstract further points out that while it is desirable that drugs intended for other than medical use should reach a certain standard of purity, it would appear that this could be achieved by other means than defining them in a pharmacopœia, and that in the compilation of the Pharmacopœia all considerations should be subordinated to the needs of the medical profession, and as a guide to pharmacists (*Pharm. J. (Lond.)*, 1910, v. 55, p. 323).

Scope of the Pharmacopœia.—A. S. Loevenhart, in a discussion on the scope of the Pharmacopœia of the United States, points out that the final decision regarding the scope of the Pharmacopœia was left, by the Convention, in the hands of the General Committee of Revision and that this committee can, if it will, restrict the scope to drugs that are generally recognized as being useful or having therapeutic value (*J. Am. M. Ass.*, 1910, v. 55, p. 1370).

An editorial discussing the scope of the forthcoming Pharmacopœia of the United States points out that considerable restriction and weeding out are desirable. The adoption or rejection of the broad principle of wise restriction will determine whether the book is to be a book of scientific materia medica or merely a book of pharmaceutical formulas and standards; or, in other words, whether the Pharmacopœia is to be revised in the interest of medicine or in the interest of medicines (*J. Am. M. Ass.*, 1910, v. 55, p. 1387).

Publicity in Connection with Pharmacopœial Revision.—The revisers of the British Pharmaceutical Codex are giving an unusual amount of publicity to the proposed changes that are to be introduced in that book. For some weeks the *Pharmaceutical Journal* has presented formulas with the request that criticisms

and further suggestions be sent to the Codex Revision Committee.

Metric System.—An editorial points out that the movement to introduce the metric system of money and weights and measures into Great Britain is at least making progress and points out that the metric system has been adopted by all civilized countries with the exception of Great Britain, the British Colonies, and the United States. The colonies, as a whole, have consistently advocated the metric system whenever an opportunity offered, but their attitude up to now has been one of expectancy (*Pharm. J. (Lond.)*, 1910, v. 85, p. 412).

Synthetic Remedies.—V. Coblenz reviews the recent progress among medicinal synthetics and points out that during the last three years the atmosphere relating to synthetic remedies has been cleared somewhat, through the aid of European State Boards of Health and the Council on Pharmacy and Chemistry of the American Medical Association, who have established a clear distinction between true synthetics, medicinal combinations, and quack nostrums (*J. Ind. and Eng. Chem.*, 1910, v. 2, p. 352).

A review of the new remedies included in 15 of the most widely-used pharmacopœias presents some rather interesting information relating to the nomenclature that has been adopted and the recognition accorded to several of the new remedies. The following is an indication of the occurrence of these remedies in the several pharmacopœias:

Antipyrin, phenacetin, salol, and sulfonal.....	15
Guaiacol carbonate	13
Dermatol	13
Diuretin	12
Antipyrin salicylate	11
Acid, acetyl-salicylic	7
Hexamethylenamine	6
Heroin	5
Silver proteinate	5
Veronal	3

(*Pharm. Ztg.*, Berlin, 1910, v. 55, p. 604).

Pharmacology and the Clinic.—An editorial calls renewed attention to the fact that clinicians are using drugs more and more on the basis of experimental observation, and points out that a

conservative and sane acceptance of the results of laboratory experimentation will serve to eliminate a tremendous amount of rubbish that has accumulated in the Pharmacopœia (*J. Am. M. Ass.*, 1910, v. 55, p. 781).

Proprietaries in Italy.—A. Zambler, in a communication in the *Gazetta degli Ospedali*, voices the general discontent that is being felt in Italy with the way in which proprietary medicines are being advertised. He points out that the third edition of the Italian Pharmacopœia includes a notable display of proprietaries, and that it is the only pharmacopœia in the world that vouchsafes such an effective form of official advertising to the manufacturer of proprietary remedies (*J. Am. M. Ass.*, 1910, v. 55, p. 879).

Alkaloids.—H. C. Fuller outlines a method for the separation of cocaine and strychnine and atropine and strychnine when they occur together. The method depends on the ready hydrolysis of cocaine and of atropine, leaving the strychnine to be shaken out with chloroform (*J. Ind. and Eng. Chem.*, 1910, v. 2, p. 378).

Asafetida.—W. A. Pearson points out that much of the variation regarding the composition of different consignments of asafetida is due to the variation in sampling this drug. He calls attention to the difficulty of collecting representative samples and the need for adopting a more uniform method of collecting samples (*J. Ind. and Eng. Chem.*, 1910, v. 2, p. 421).

Agar-agar.—Th. Dietzsch calls attention to a form of cut agar-agar that is now available on the European markets. This coarsely comminuted form is thought to be medicinally superior to the ground or powdered substance, but is equally well taken by the patient. In practice the substance is best administered with porridge or oatmeal at breakfast time, in doses of about a tablespoonful (*Pharm. J. (Lond.)*, 1910, v. 85, p. 383).

Arseno-Benzol and Arsen-Phenol-Amin are names that are being applied to Ehrlich's "606," the remedy for syphilis and allied diseases that has attracted such wide-spread attention abroad. The remedy will be marketed in this country in the very near future and promises to be one of the most popular new remedies ever introduced.

Camphenol.—The chemical laboratory of the American Medical Association reports that examination of camphenol shows that this preparation is but a modification of the well-known camphorated phenol: a portion of the phenol having been replaced by cresol

and the resulting liquid diluted and emulsified with gelatin or some similar substance. The production is said to contain relatively small quantities of the active constituents (*J. Am. M. Ass.*, 1910, v. 55, p. 1662).

Capsicin.—E. K. Nelson discusses the detection of comparatively small amounts of capsicum in mixtures by isolating the contained capsin and testing physiologically (*J. Ind. and Eng. Chem.*, 1910, v. 2, p. 419).

Cocaine, Volatility of.—H. C. Fuller points out that cocaine is volatile at 100° C. and that this fact is important in connection with analytical work and should be noted in the Pharmacopœia (*J. Ind. and Eng. Chem.*, 1910, v. 2, p. 426).

Diaspirin.—This is described as being succinyl-disalicylic acid; a salicylic acid derivative, produced by the interaction of the two carboxyl groups of succinic acid with the phenolic hydroxyls of two molecules of salicylic acid and the elimination of two molecules of water. Diaspirin is an odorless, and almost tasteless, white, crystalline powder said to melt at about 178° C. It is a dibasic acid which reacts with bases, organic and inorganic, to form salts. The usual dose is 1 gramme three times a day (*J. Am. M. Ass.*, 1910, v. 55, p. 666).

Digestive Tablets.—Puckner and Warren discuss the fallacy of using any one of the many combinations of pepsin, pancreatin, diastase, hydrochloric acid, and lactic acid that are offered in the form of compressed tablets. They point out that "shot gun prescriptions" of this type catch the unthinking doctor as well as the self-drugging public who still adhere to the old theories regarding digestive ferments (*J. Am. M. Ass.*, 1910, v. 55, p. 710).

Ergot.—Wood and Hofer discuss the pharmacology of ergot and point out that ergot is a stimulant to all the unstripped muscle tissue of the body. They believe that the degree of elevation of blood-pressure affords an accurate criterion of the activity of ergot and that the active principle is an alkaloidal substance which occurs in the drug, probably in chemical union with a resinous body (*Arch. Int. Med.*, 1910, October. *J. Am. M. Ass.*, 1910, v. 55, p. 1681).

Ferratin.—Chemically this is known as sodium ferrialbuminate and contains the equivalent of 6 per cent. of metallic iron. Ferratin occurs as a light brown, tasteless powder having a faint odor. It is soluble in weak alkaline aqueous solutions, from which solution it is precipitated by hydrochloric acid. It is given in doses of

0.5 gramme, three or four times a day (*J. Am. M. Ass.*, 1910, v. 55, p. 666).

Arsenoferratin.—Sodium arsenoferrialbuminate is an arsenic iron albumin compound, obtained by introducing the element arsenic into the molecule of ferrialbuminic acid. It is said to contain the equivalent of 6 per cent. of metallic iron in organic combination, and the equivalent of 0.06 per cent. of elementary arsenic. Arsenoferratin is a brown, almost odorless and tasteless powder that is easily soluble in dilute alkaline solutions. The dose is 0.5 gramme, three or four times a day (*J. Am. M. Ass.*, 1910, v. 55, p. 666).

Ginseng.—A news note announces that Dr. K. Miyake and Mr. Toniye have been sent to this country by the Korean Government to investigate the cultivation and particularly the diseases of ginseng. This drug is considered to be of great importance in Korea and is under a government monopoly. During the past few years there has been a remarkable reduction in the output, due to various diseases similar to those affecting the plant in this country (*Science*, 1910, v. 32, p. 625).

Hexamethylenamine.—Molecular combinations of hexamethylenetetramine with guaiacol are being experimented with and promise to be useful additions to guaiacol therapy (*Chem. Tech. Repertorium*, 1910, v. 34, p. 509).

Hexamethylenamine in Pellagra.—B. B. Bagby reports unusually satisfactory results from the treatment of a case of pellagra with 15 grain doses of hexamethylenamine, given three times a day, and quotes Beverly R. Tucker as having had equally promising results from the use of the same drug (*J. Am. M. Ass.*, 1910, v. 55, p. 1663).

Hydrogen Peroxide.—Linwood A. Brown discusses the determination of free acid in hydrogen peroxide solutions and points out that the U.S.P. test for free acid does not give correct results. He reports a number of experiments and concludes that acetanilid acts the part of a free acid and seriously interferes with securing accurate results. Direct titration in the cold was found to be satisfactory and gives results that are sufficiently accurate for all practical purposes (*J. Ind. and Eng. Chem.*, 1910, v. 2, p. 377).

Hydronaphthol.—A sample of hydronaphthol examined in the Chemical Laboratory of the American Medical Association had the characteristic appearance, odor, and taste of naphthol and

responded to all of the U.S.P. tests for betanaphthol with the exception of the melting point, which was found to be 119°C ., in place of 122°C ., an indication of impurity. The conclusion is reached that hydronaphthol is merely a trade name for betanaphthol (*J. Am. M. Ass.*, 1910, v. 55, p. 878).

Iron iodobehenate.—Basic iodobehenate of iron is described as a reddish brown, amorphous, nearly odorless and tasteless powder, containing about 25 per cent. of iodine and 5.6 per cent. of iron. It is insoluble in water and in alcohol, but readily soluble in ether (*Chem.-Tech. Repertorium*, 1910, v. 34, p. 509).

Kephalose.—J. R. Hurly reports on the examination of "Kephalose," a French proprietary exploited in the Philippine Islands. The nostrum was found to consist largely of antipyrin and caffeine with a trace of acetanilid and a small percentage each of potassium bromide and sodium carbonate (*J. Am. M. Ass.*, 1910, v. 55, p. 1040).

Lime.—L. W. Bahney outlines a method for the rapid estimation of calcium oxide in lime. He points out that the percentage of calcium oxide depends on: 1. The purity of the limestone. 2. The degree of burning temperature and time. 3. The length of time the product has been stored, and whether it has been dry or damp during this period of storage. The method of assay depends on the titration of finely powdered lime suspended in distilled water with oxalic acid, using phenolphthalein as the indicator (*J. Ind. and Eng. Chem.*, 1910, v. 2, p. 407).

Papaver somniferum L., M. G. J. M. Kerbosch presents a comprehensive study on the formation and distribution of several of the more important opium alkaloids in different parts of *Papaver somniferum L.* (*Arch. d. Pharmazie*, 1910, v. 248, p. 536).

Santonica.—R. Goerlich calls attention to the work by Katz on the determination of santonin in santonica and in preparations of that drug, and outlines a modification of the latter's method (*Apoth. Ztg.* (Berlin), 1910, v. 25, pp. 801, 812).

Sera.—An editorial comments on the untoward effects of therapeutic serums and points out that accidents and untoward effects, which fortunately are extremely rare, usually follow a first injection of serum, only a very few instances being reported in which a second injection has caused serious or distressing symptoms. The percentage of fatalities following the injection of serum is

very small; only a fraction of one per cent. suffer from serious ill effects (*J. Am. M. Ass.*, 1910, v. 55, p. 1649).

Supracapsulin.—This is the name used for epinephrine by the Cudahy Packing Co., South Omaha, Neb. (*J. Am. M. Ass.*, 1910, v. 55, p. 666).

Thigenol.—Solution of sodium sulpho-oleate, Roche, is described as being a solution of the sodium salts of synthetic sulpho-oleic acids, containing 2.85 per cent. of sulphur. Thigenol is a dark brown liquid having a faint sulphurous odor. It is soluble in one or more parts of water, dilute alcohol, glycerin, and in oily or fatty bases. It is used locally and is also administered internally in doses of from 0.2 to 0.6 gramme (*J. Am. M. Ass.*, 1910, v. 55, p. 666).

BOOK REVIEWS.

A TEXT-BOOK OF BOTANY AND PHARMACOGNOSY. Intended for the use of students of pharmacy, as a reference book for pharmacists, and as a hand-book for the food and drug analyst. By Henry Kraemer, Ph.B., Ph.D., the Philadelphia College of Pharmacy. Illustrated with over 300 plates, comprising about 2000 figures. Fourth edition, revised and enlarged. Philadelphia and London: J. B. Lippincott Company.

The fourth edition of Professor Henry Kraemer's "Text-Book of Botany and Pharmacognosy" which has just appeared from the press is printed on excellent, heavy paper, with clear, easily readable type, is well bound, and is a fine appearing book. Like its predecessors it is profusely illustrated with half-tone photographs and line drawings. While in former editions the illustrations have been excellent, a number of improvements have been made, so that all seem perfect in every detail. In no other book extant is more care given to every detail.

The work is the most comprehensive now in print, and too much cannot be said in praise of this latest product of Prof. Kraemer's life-work.

The work is divided into four parts. Part I is given to botany and consists of five chapters. Chapter I will be read with interest by every student of botany. The text and illustrations carry one along to a true conception of the evolution in plant life. In Chapter II, roots, stems, fruits, etc., are studied in classes, with reference to their "Outer Morphology." Chapter III is an exhaustive chap-

ter on the inner morphology of the higher plants. The various cell tissues, the cell walls, and cell contents are freely shown by numerous line drawings. Pharmacists should be more familiar with this subject, and the time is coming when a microscope will be an item in the equipment of every pharmacy. Chapter IV treats of the classification of Angiosperms yielding drugs, food products, and other economic products of general interest; and Chapter V is devoted to the cultivation of medicinal plants. Much must be done in this direction in the near future.

Part II is of special interest to pharmacists. In Chapter I all of our crude drugs are carefully considered, and all allied plants are mentioned showing the points of difference. Crude drugs, microscopic sections, tissue elements, crystals, etc., are fully illustrated, and the descriptive matter carefully written, concise and complete. In these days when most drugs are bought in powdered or ground condition, the pharmacist should be able to determine the purity of his purchases. He may become able to do this by careful study of Chapter II of this section. Powdered drugs and food products are here grouped according to the cellular tissues present, the size and character of the starch granules, the various crystals, etc.

In Part III the reagents necessary for microscopic work are presented, and microscopic technic discussed. Part IV is a new section. About forty pages are included, treating of the micro-analysis of the more important active constituent of drugs. This is interesting and instructive to any one familiar with the use of the petrographical microscope.

Professor Kraemer is our most thorough and painstaking investigator in this department of study, and this edition shows the exactness of detail that characterizes his work. While his technical knowledge is the highest, his writings are singularly free from burdensome technicalities, and are easily understood by the student. I have read this edition with much pleasure and am glad to give expression of my appreciation of it. C. F. NIXON.

THE PHARMACOPŒIA AND THE PHYSICIAN. By Robert A. Hatcher, M.D., and Martin I. Wilbert, Ph.M. Third revised edition. Chicago: American Medical Association Press, 1910.

This volume consists of a series of articles which originally appeared in the *Journal of the American Medical Association*, discussing the chief substances in the United States Pharmacopœia, classifying them according to their uses and describing their methods

of combination and how they may take the place of many proprietary preparations for which extravagant claims have been made.

The book has been thoroughly revised and brought into accord with present-day teachings and facts. The authors are champions of the U. S. Pharmacopœia and the well-established remedies contained therein. The only reason for the extensive use of hundreds—yes thousands—of preparations which are upon the market to-day is simply the fact that we know very little about any of them. This work of Hatcher and Wilbert is a step in the right direction in that it acquaints the medical student and the practitioner with the nature and uses of the official substances and their preparations.

DIE ATHERISCHEN ÖLE. Von E. Gildemeister und Fr. Hoffmann. Zweite Auflage von E. Gildemeister. Bearbeitet im Auftrage der Firma Schimmel & Co. in Miltitz bei Leipzig. Erster Band. Mit zwei Karten und Zahlreichen Abbildungen. Verlag von Schimmel & Co., Miltitz bei Leipzig. (Für den Buchhandel: L. Staackmann, Leipzig), 1910.

It is now a little more than ten years since the first edition of the work on "The Ethereal Oils," by Gildemeister and Hoffmann, was published by Schimmel & Co. This book has been invaluable to the student of phytochemistry as well as the dealer and analyst of volatile oils. During this time so many investigations have been carried on and the literature has been so enriched, that we are indeed fortunate in having a new edition comprising these advances. The amount of material gotten together by Dr. Gildemeister was so large that it has seemed advisable to the firm of Schimmel & Co. to publish the work in two volumes. The first volume, which has been received, includes the historical facts concerning the individual oils and remains much the same as originally written by that master of historical studies, Dr. Fred. Hoffmann. This volume also contains a description of the principle constituents of the volatile oils and the assay methods used in determining them. A new feature is the chapter on the method for extracting the odorous principles from flowers, through extraction, enfleurage, and maceration. The chapter on "the theoretical principles involved in the distillation of ethereal oils and the separation of the various constituents through this process" has been omitted from this volume and been made into a distinct volume as already noted in this JOURNAL (July, p. 345).

The well-known tables of the first volume have been revised

and enlarged and an additional table is given which will be found of great value to the analyst. By using 1.5 Gm. of the volatile oil and adding the required amount of half-normal potassium hydroxide solution for saponification, not only can the ester value of the oil be determined, but the per cent. of the esters and alcohols may be ascertained without any further calculation. This promises to be of the greatest possible assistance to all those who desire an accurate knowledge of the character of the oils that they purchase.

The subject matter has been well prepared; the necessary facts with citation to literature have been given, and the information includes not only the recent scientific researches regarding the principle constituents of the volatile oils and their constitution, but the approved laboratory methods for obtaining a true knowledge of the quality of the respective oils under consideration. Every dealer in volatile oils and especially all retail pharmacists will find this book of great interest and practical value.

E. MERCK'S ANNUAL REPORT OF RECENT ADVANCES IN PHARMACEUTICAL CHEMISTRY AND THERAPEUTICS. 1909. Volume xxiii. E. Merck, Chemical Works, Darmstadt. 1910.

In addition to the comprehensive review of recent literature relating to pharmaceutical products and therapeutics there is an excellent chapter of 84 pages on "Serum Therapy and Bacteriotherapeutic Preparations." We do not recall having seen anything so complete and instructive and yet concise. Among the most interesting reports, from a therapeutic viewpoint, is that on the use of perhydrol for combating nasopharyngeal and oral infections. Dr. Simon Flexner, of the Rockefeller Institute for Medical Research, recently pointed out that the virus of poliomyelitis can enter the nervous system through the abraded mucous membrane of the nose, and that the virus is quickly destroyed by a dilution of perhydrol. It is similarly used in summer catarrh and scarlet fever.

A TREATISE ON PHARMACY FOR STUDENTS AND PHARMACISTS. By Professor Charles Caspari, Jr., University of Maryland. Fourth edition, enlarged and revised. Illustrated with 330 engravings. Philadelphia and New York: Lea and Febiger, 1910.

The object of this text-book is to furnish the student with the *raison d'être* for the processes and tests employed in the preparation and testing of pharmaceutical products; and to give the retail pharmacist a trustworthy guide for use in conjunction with the U. S. Pharmacopœia and National Formulary. It is not too much to say

that it amply fulfils this purpose and is an excellent companion to these standard works.

The work is divided into three parts. Part I comprises General Pharmacy, which includes the general study of pharmaceutical processes, weights and measures, etc. Part II is devoted to Practical Pharmacy and treats of the official galenical preparations, together with many of the operations conducted at the dispensing-counter. In Part III we find an excellent treatment of Pharmaceutical Chemistry.

All parts of the book are well handled and display the author's ability as a writer, his excellent judgment as a scholar and judicious reader, and his competence as a practical writer and analyst of many years' experience. The book will appeal to students in pharmacy, the retail pharmacist, and the manufacturer.

PLANT ANATOMY FROM THE STANDPOINT OF THE DEVELOPMENT AND FUNCTIONS OF THE TISSUES AND HAND-BOOK OF MICRO-TECHNIC. By Prof. William Chase Stevens, University of Kansas. Second edition, revised and enlarged. With 152 illustrations. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street, 1910. \$2.00 net.

This book of Stevens has a number of features to commend it. The "generalized diagrams" used throughout the book enable the student to grasp almost immediately the three views of cells and tissues. This is especially important to the pharmacognosist in his study of powdered drugs and foods.

In the present edition Prof. Stevens has added a chapter on reproduction, and considers the processes of nuclear division, behavior of pedigree hybrids, the working of Mendel's laws, and theory of pangenetic interchange. These discussions are of importance even to the pharmacist, as sooner or later our studies on drugs must begin with the growing plants. Furthermore, it is quite likely that the breeding of drug plants will furnish data of the greatest value for the study of the valuation of crude drugs. A sufficient number of experiments have already been made upon species of *Cinchona* and varieties of *Atropa Belladonna* to show not only the "mosaic character of the offspring of hybrids" but that there is a variation in the active constituents.

The point of view of the author of this text-book is a good one and the book is to be recommended to both teachers and students of our schools and colleges of pharmacy.

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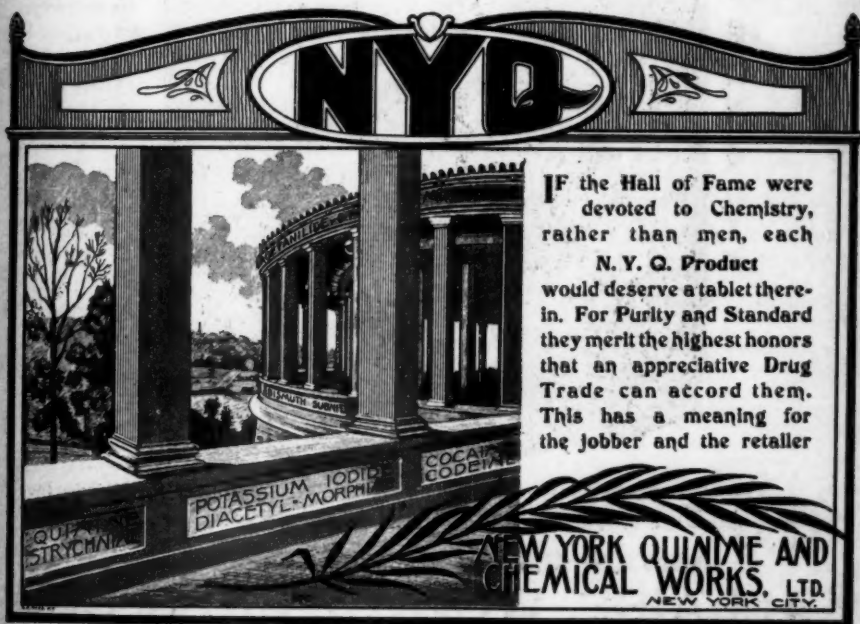
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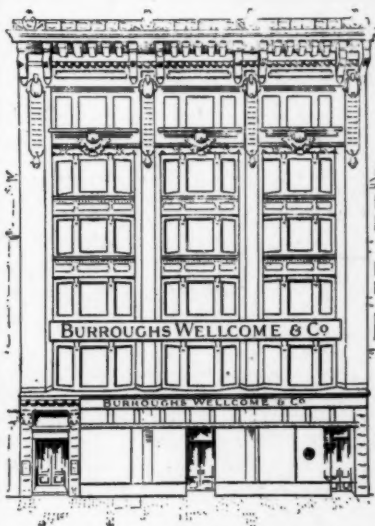
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